Reg. No. : | | | | | | | | | | | | |

**Question Paper Code : 50873**

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Fourth Semester

Mechanical Engineering

ME 8451 — MANUFACTURING TECHNOLOGY – II

(Common to Industrial Engineering/ Industrial Engineering and Management/ Mechanical Engineering (Sandwich)/Mechanical and Automation Engineering)

(Regulations 2017)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define rake angle.

2. What is oblique cutting?

3. Write any four operations that can be performed on lathe.

4. What is the use of mandrel?

5. Differentiate between vertical shaper and slotter.

6. Define up-milling and down milling.

7. List the abrasives used in the manufacture of abrasive wheel.

8. Define honing.

9. Classify NC machines.

10. Write the functions of codes M00 and M01.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss about the following tool materials in terms of their composition, hardness and applications :

(i) Carbon steels (4)

(ii) HSS (3)

(iii) Cemented carbides and (3)

(iv) Ceramics. (3)

Or

(b) Classify and Elaborate tool wear.

12. (a) Differentiate between capstan and turret lathe.

Or

(b) Discuss the following lathe operations in brief :

(i) facing (4)

(ii) knurling and (5)

(iii) drilling. (4)

13. (a) Calculate the time required for taking a complete cut on a plate 600 × 800 mm if the cutting speed is 10 m/min. The ratio of cutting time to return stroke is 4:1 feed is 2 mm. Take the clearance at each end as 25 mm.

Or

(b) A M.S. bar of 400 × 500 mm is to be machined using a shaper. Find the time taken to complete one cut at a cutting speed of 12 m/min. The ratio of return time to cutting time is 2:3 and the feed is 1.25 mm. Take the clearance at each end as 75 mm.

14. (a) Discuss about :

(i) traverse grinding (5)

(ii) plunge cut grinding and (4)

(iii) full depth grinding in brief. (4)

Or

(b) Explain about centreless grinding with neat sketches.

15. (a) Explain about micromachining.

Or

(b) Explain about Numerical machine tools.

PART C — (1 × 15 = 15 marks)

16. (a) In an orthogonal cutting of 40 mm dia steel tube, the data given are: rake angle = 35°, cutting speed 20 m/min, feed = 0.1 mm/rev, cutting force = 2000N and feed force = 800N. Continuous chip length in one length is 50 mm. Calculate coefficient of friction, shear angle, chip velocity and chip thickness at tool force.

Or

(b) A through hole 38 mm in diameter is to be finished to 42 mm using a drilling machine. The total thickness of the work piece is 50 mm. Calculate the depth of cut and machining time. Take cutting speed as 0.32 m/s and feed as 0.6 mm /revolution.

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